

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-7 (Canceled).

Claim 8 (Withdrawn) The method of claim 6, wherein the particle is magnetic and is moved to and from the surface in an uneven magnetic field.

Claim 9 (Withdrawn) The method of claim 6, wherein the particle is charged and is moved to and from the surface by an electric field.

Claims 10-13 (Cancelled).

Claim 14 (Withdrawn) An assembly for performing an electrophoretically-assisted assay, comprising:

- an upper and a lower electrode chamber;
- an electrode system disposed in the upper and lower electrode chamber,
- a plurality of channels through which an electrical current passes; and
- a plurality of semi-permeable membranes each having an activated surface,

wherein the semi-permeable membranes are positioned across the channels such that current passing through the plurality of channels, passes through the plurality of semi-permeable membranes, and wherein the semi-permeable

membranes are penetrable for salt and buffer ions, but not for protein or polynucleotide analytes.

Claim 15 (Withdrawn) The assembly of claim 14, further comprising a deflector disposed in the lower electrode chamber, wherein the deflector is effective for deflecting away from the bottom of the channels, gaseous electrochemical products that form in the lower electrode chamber.

Claim 16 (Withdrawn) The assembly of claim 14, wherein an array of probe molecules is bound to each semi-permeable surface.

Claim 17 (Withdrawn) A plate for an active assay, comprising a plurality of channels and a plurality of semi-permeable membranes having an activated surface with probes bound thereto, wherein each membrane of the plurality of semi-permeable membranes is positioned across a channel of the plurality of channels.

Claim 18 (Withdrawn) The plate of claim 17, wherein a protein or polynucleotide probe is bound to the activated surfaces.

Claim 19 (Withdrawn) The plate of claim 17, wherein an array of probes are bound to each activated surface of the plurality of semi-permeable membranes.

Claim 20 (Withdrawn) The plate of claim 17, wherein the semi-permeable membrane is an activated cellulose membrane.

Claim 21 (Currently Amended) A method for detecting analytes comprising:

- a. immobilizing first probe molecules onto a surface of a first semi-permeable membrane that is positioned across a plurality of isolated channels formed from wells of a microplate, wherein only edges of the first semi-permeable membrane are bound to a first support;
- b. placing a second semi-permeable membrane in a position that is parallel to the first semi-permeable membrane, forming a plurality of isolated gaps with the first semi-permeable membrane,
 - i. wherein the first probe molecules are inside the gap and facing the second semi-permeable membrane; and
 - ii. wherein only edges of the second semi-permeable membrane are bound to a second support;
- c. contacting the side of the first semi-permeable membrane that is outside the gap with a first electrolyte solution, the first electrolyte solution being in contact with a first electrode;
- d. contacting the side of the second semi-permeable membrane that is outside the gap with a second electrolyte solution, the second electrolyte solution being in contact with a second electrode;
- e. filling at least one of the plurality of the gaps with an analyte solution or suspension to create a fluid connection between analytes in the analyte solution or the suspension with the first probe molecules;

- f. applying an electric potential to the first electrode and the second electrode to electrophoretically move the analytes toward the first probe molecules;
- g. removing the analytes that are unbound or weakly bound to the first probe molecules; and
- h. detecting analytes bound to the first probe molecules.

Claim 22 (Previously Presented) The method according to claim 21, further including introducing a suspension of particles immobilized with second probe molecules into the analyte solution or the suspension to detect the analytes bound to the first probe molecules.

Claim 23 (Previously Presented) The method according to claim 22, wherein the particles are magnetic particles.

Claim 24 (Withdrawn) The method according to claim 23, wherein the particles are the magnetic particles, further including applying a magnetic field to move the magnetic particles towards the first semi-permeable membrane, allowing the second probe molecules to bind with the analytes that are bound to the first probe molecules.

Claim 25 (Withdrawn) The method according to claim 24, further including reversing the magnetic field to move unbound or weakly bound magnetic particles.

Claim 26 (Withdrawn) The method according to claim 25, wherein the detecting is performed by detecting bound magnetic particles.

Claim 27 (Withdrawn) The method according to claim 23, wherein the particles are the magnetic particles, further including applying an uneven localized magnetic field

to direct the magnetic particles towards the first semi-permeable membrane, allowing the magnetic particles to stack over an area of the first semi-permeable membrane.

Claim 28 (Withdrawn) The method according to claim 27, wherein the detecting is performed by moving the stack with the uneven localized magnetic field, allowing the second probe molecules to bind with the analytes that are bound to the first probe molecules.

Claim 29 (Withdrawn) The method according to claim 23, further including applying an uneven magnetic field to direct the magnetic particles towards the first semi-permeable membrane, allowing the magnetic particles to contact the surface of the first semi-permeable membrane and be pushed over the surface by flow while remaining in contact with the surface.

Claim 30 (Withdrawn) The method according to claim 29, wherein the detecting is performed by monitoring where the magnetic beads are arrested.

Claims 31-32 (Canceled).

Claim 33 (Currently Amended) The method according to claim 21, wherein the surface layer of the first semi-permeable membrane is [[an]] exposed and activated surface by plasma prior to the immobilizing and is penetrable for salt and buffer ions, but not for analytes.

Claim 34 (Currently Amended) The method according to claim 21, wherein the analyte solution is automatically stabilized against convection due to membrane polarization, resulting in a self-forming density gradient.

Claim 35 (Currently Amended) The method according to claim 21, wherein comprising a
multitude of the first semi-permeable membrane and a multitude of the second
semi-permeable membrane ~~are used in parallel to form a multitude of gaps.~~

Claim 36 (Previously Presented) The method according to claim 21, further including
deflecting bubbles with a frame having a porous membrane.

Claim 37 (Previously Presented) The method according to claim 36, wherein the frame
is placed at an angle of at about 30° to about 50° relative to the microplate.

Claim 38 (Currently Amended) The method according to claim 21, wherein:

- i. glue is used to bind the first semi-permeable membrane to the first support
and to bind the second semi-permeable membrane to the second support;
and
- ii. glue vapor is removed by directing a flow of air through each of the
plurality of channels.

Claim 39 (Currently Amended) The method according to claim 38, wherein the glue is
~~ee~~tylcyanoacrylate glue.

Claim 40 (Currently Amended) The method according to claim 39, wherein the glue is
octylcyanoacrylate glue.

Claim 41 (Cancelled).

Claim 42 (Withdrawn) The method according to claim 33, wherein the surface layer is
activated by hydrophobization.

Claim 43 (Previously Presented) The method according to claim 23, wherein the
particles are moved using centrifugal forces.

Claim 44 (New) The method according to claim 33, wherein at least the first support is activated by plasma.

Claim 45 (New) The method according to claim 44, wherein the activation of the surface and the at least first support are activated by plasma simultaneously.

Claim 46 (New) A method for detecting analytes comprising:

- a. immobilizing first probe molecules onto a surface of a first semi-permeable membrane attached to the bottom of wells of a microplate and adjacent a plurality of channels formed from the wells;
- b. placing a second semi-permeable membrane in a position that is parallel to the first semi-permeable membrane, forming a gap with the first semi-permeable membrane, wherein the first probe molecules are inside the gap and facing the second semi-permeable membrane; and
- c. contacting the side of the first semi-permeable membrane that is outside the gap with a first electrolyte solution, the first electrolyte solution being in contact with a first electrode;
- d. contacting the side of the second semi-permeable membrane that is outside the gap with a second electrolyte solution, the second electrolyte solution being in contact with a second electrode;
- e. filling the gap with an analyte solution or suspension to create a fluid connection between analytes in the analyte solution or the suspension with the first probe molecules;

- f. applying an electric potential to the first electrode and the second electrode to electrophoretically move the analytes toward the first probe molecules; and
- g. detecting analytes bound to the first probe molecules.

Claim 47 (New) The method according to claim 46, comprising a plurality of isolated channels and a plurality of isolated gaps.

Claim 48 (New) The method according to claim 46, wherein the surface of the first semi-permeable membrane is exposed and activated by plasma prior to the immobilizing and is penetrable for salt and buffer ions, but not for analytes.

Claim 49 (New) The method according to claim 46, wherein the analyte solution is automatically stabilized against convection due to membrane polarization, resulting in a self-forming density gradient.

Claim 50 (New) The method according to claim 46, wherein:

- i. glue is used to bind the first semi-permeable membrane to the first support and to bind the second semi-permeable membrane to the second support; and
- ii. glue vapor is removed by providing air through each of the plurality of channels.